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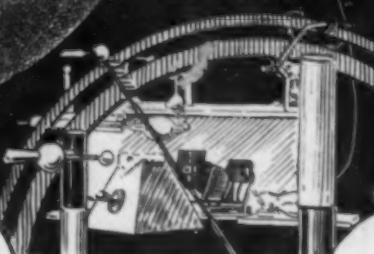
October, 1900.

THE AMERICAN

# X-RAY JOURNAL

A MONTHLY  
DEVOTED  
TO THE  
PRACTICAL  
APPLICATION  
OF THE  
NEW SCIENCE  
AND TO THE  
PHYSICAL  
IMPROVEMENT  
OF MAN.

HEBER ROBARTS M.D., M.E. EDITOR.  
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# THE AMERICAN X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

PUBLISHED MONTHLY BY THE AMERICAN X-RAY PUBLISHING COMPANY.

HEBER ROBARTS, M. D., M. E., Editor.

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*DR. MIHRAN K. KASSABIAN,  
Philadelphia, Pa.*

# The American X-Ray Journal.

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## ROENTGEN SOCIETY OF THE UNITED STATES.

The preliminary announcement of the meeting of the Roentgen Society of the United States, at the Academy of Medicine, New York City, December 13th and 14th, 1900, was sent out to the professions, medical, electrical and dental press, with the laudable purpose of increasing the membership of the association, enlarging the circulation of the JOURNAL, the official organ of the society, and promotion of the new science with all the members of the society. Each member, we hope, may secure an acceptable applicant for the society, having our plans of work, the copy of our constitution, blanks, etc., at hand. We are sure that every member of the society feels an interest in its growth, and we desire to impress the fact on all that a little effort on the part of each one, will soon see its members doubled, and its influence with possibility of good enlarged.

The AMERICAN X-RAY JOURNAL is the only one of its kind in the country, has the largest reading circulation of any medical journal in St. Louis, Mo., contains more original reading matter, more news in electrology and radiology than all others together, covering practically the whole field of current literature on the x-ray from the whole world. The proceedings of our meeting will be published in the JOURNAL and we can promise you now already a literature, on the unknown' ray, which can

not be gotten on every occasion. Dr. S. H. Monell, New York, N. Y. Chairman of the Committee on Arrangement, has full charge of the work in New York, and all those who wish to participate in the exhibit may communicate with him, and also those who intend to exhibit their own radiographs of actual cases, etc.

Our society was organized for scientific and practical purpose, for mutual advantage and defence, and if necessary offense.

We wish to enroll the entire professions, all the honest workers in the x-ray field under our banner. It appears we cannot do so and be in affiliation with other regular, especially medical societies. But to succeed in one object we must go it alone since we are purely a scientific and practical society we can do so, without any action against the code. We are after the quacks, in and out of the professions. We are after the fellows who misrepresent the useful x-ray and do work not honest in its purpose. We want to watch them, watch their work and educate the public to be on guard. But we also want to keep out of our society the howling "expert" and doctor who may be armed with a certificate from the Board State Medical Examiners, giving him the right to practice in our States, and who will get up in our midst, advertise "to heal and diagnose all the chronic diseases," with his second-hand medicine, called the x-ray apparatus. How are we going to do all these things? Very simple, through

our national organization, mutual help and support of proper legislation in all the States of the Union, and education of the people, for their benefit and the benefit of ourselves, through the press and schools and later on, perhaps, with the help of free popular literature.

For complete information regarding our society, send for the preliminary an-

nouncement to the secretary, Cedar Rapids, Iowa; for particulars in regard to the exhibit at our December meeting and actual demonstrations, etc.; write to the Chairman of the Committee on Arrangements, Dr. S. H. Monell, The New York School of Special Electro-Therapeutics, No. 17 West 27th street, New York, N. Y.

J. RUDIS-JICINSKY, Secy. and Treas.



ONE OF THE ACTIVE ROOMS IN THE LABORATORY OF NIKOLA TESLA.

EXCITATION OF THE CROOKE'S TUBE  
BY THE STATIC MACHINE.

## Hysteresis.

BY JOHN T. PITKIN, M. D.

## Chapter IX.

When a metallic conductor is excited by a battery, a dynamo or a static machine, the conductor is electrified, the surrounding medium magnetised, the temperature of the electric and dielectric elevated, and the molecular mechanical activity intensified. So constant is the correlation of these allied forces, that the amount of any one of them may be employed as the measure of the others. Thus electricity may be measured by the strength of the magnetic field, the degree of latent heat released, or the acceleration of mechanical action with which it is accompanied, the capacity of the conductor being duly considered.

If the current is unidirectional and of invariable strength, the degree of heat evolved may be expressed by the following equation

$$\frac{\text{E. M. F.}}{\text{C}} = \text{H}$$

in which E. M. F. represents the pressure or voltage C the strength of current and H the calorific effect. The heat evolved corresponds to the work required to overcome certain preexisting molecular forces, which are constantly operating to restore the conductor to the condition which existed prior to electrification. The rise in temperature also corresponds to the Ohmic resistance i. e.

$$\frac{\text{E. M. F.}}{\text{C}} = \text{R}$$

Again, it is related to the second power of the current, and is technically known as the Joule effect.

Such a current generated by a sixteen or twenty, thirty-two inch, revolving plate static machine, passed through a Crooke's tube suited to the apparatus, will heat the target to redness, and the glass bulb be-

come slightly warm to the touch, caused by the Joule effect and the impact of molecules against the reflector (the bulb will be a little warmer than elsewhere at the anodal extremity) but the target or electrodes will not fuse or become contorted, the glass bulb will not be cracked, punctured or otherwise disabled, even if the excitation is continued indefinitely. Should one or more spark gaps be placed in the circuit, the current will be rendered undulatory, and disruptive in character. The molecules of which, the electrical conductors, electrodes and reflector and the dielectric glass globe are composed, are alternately subjected to the coercive force of electro-magnetism and the preexisting forces, the former at the make the latter at the break of the circuit. The amount of heat evolved will correspond to the energy employed in making the interchanges. The temperature of the Crooke's tube placed in simple series will rise rapidly, and if of the American static type and the excitation is prolonged, the target is likely to be melted at its central focus, giving it the appearance as if a small round nail had been driven from the anodal towards the cathodal side, leaving the edges ragged, frayed and projecting from the latter surface. The glass bulb is heated so as to be uncomfortable to handle but as the column of current and x-radiance are augmented the definition or clearness of the image upon the fluorescent screen or photographic plate will be proportionately intensified. This effect increases with the length of spark gap, providing the generator is able to maintain the current without short-circuiting.

When shorter spark gaps become necessary, or when less voltage and more column is desired to excite a given tube, Leyden jars may be employed as static transformers in the following manner. Place the jars upon large glass plates, connect their outer coatings with each other by a metallic rod or wire, and leave the sparking gaps in the circuit as before. Observe

that the picture is clearer than it was before the condensers were used, and that the clearness increases with the size of the jars and the length of spark gap employed until the jars are seen to blaze with each pulsation, then the machine and condensers will discharge in step and one becomes a measure of the others capacity. It follows that the greater the primary generating power of a given apparatus the more frequent will be the pulsations with a given set of condensers and the shorter the sparking gap required to obtain syn-

chronous action. As the vacuum in the Crooke's tube rises from use, sparking gap can be shortened because the resisting tube has supplied an equivalent in restraining action upon the current, requiring that the visa tergo shall gain volume and momentum before it can overcome the barrier.

and depressions, the compact and cancellous tissue of bone, less distinctly, the muscular, adipose and cutaneous tissues, the heart, liver, and other dense solid structures. Effects which can only be obtained with high tension currents of considerable volume. The undulatory current can be employed to advantage when the static machine is meagre in electrical output, when the tube is soft, of low vacuum, when the parts to be examined are very dense, or have considerable thickness, providing the tube is allowed time to cool



*BULLET LODGED IN BONY PELVIS, NEAR HEAD OF FEMUR—Excited by Holtz Machine having hard rubber collars between the revolving plates.*

chronous action. As the vacuum in the Crooke's tube rises from use, sparking gap can be shortened because the resisting tube has supplied an equivalent in restraining action upon the current, requiring that the visa tergo shall gain volume and momentum before it can overcome the barrier.

The remarks upon clearness of definition do not refer to the deep shadows more or less blurred, produced by an under excited tube or similar effects obtained on the confines of an average x-ray field, but the clearness of detail, showing the elevations

at stated intervals. The strong German or the best American coil tubes can be used with less danger of being incapacitated than those of the delicate American static pattern.

For the purpose of comparing the calorific effect upon the Crooke's tube of a current from a sixteen plate static machine with a high tension induction current, of the same strength and voltage, the primary of a suitable Rhumkoff's coil was placed on a commercial sinusoidal current. Its secondary supplied the primary of a Tesla coil, the secondary of which in turn

contained the American static tube to be tested. Under such an excitation the cyclic changes in the current from negative to positive, and from positive to negative must take place in the structures of the tube and the heat evolved be a maximum. After allowing the apparatus to operate five minutes, the electrodes and target became softened and contorted, the glass bulb too hot to handle. Upon being allowed to cool a crackling sound was heard. The current was then turned on a second time when a purple brush discharge was seen playing through its centre

BUFFALO N. Y.

#### ANSWERS TO INQUIRIES.

P. B.—The AMERICAN X RAY JOURNAL has two volumes in each year. Complete index for the first four volumes was printed in volume 4, No. 6. Volume 7, No. 6, will contain index of volumes 5, 6 and 7. Those who intend to bind their journals should wait for the December issue.

C. H. W.—X-ray light I believe to be sufficient to give visible impressions of arteries, veins, muscles, etc., but with the exception of faint outlines we have thus far failed to obtain practical views. I have seen the femoral artery in a negative and the aorta has been traced in the fluoroscope. The fault possibly contributes in three ways; the material of which the screen or film is composed, inability to interpret shadows and lack of anatomical knowledge. It may be possible for a plate or screen to be composed of an agent that in each case will have selective action upon artery, tendon or muscle. It is thinkable because of the varying constituents of these parts. This may be combined in the same radio-active agent. Absorbability of the x-rays by all the soft tissues of the body are slightly contrasted in the same plane. When overlying each other this contrast lessens on account of first, increased density which absorbs the

rays and second, distortion of the shadows caused by position. Closer study has given us readings of plates that were not recognized one year ago.

J. H. M.—Stereoskiagraphy refers to two radiographs taken  $2\frac{1}{2}$  inches apart, of the same object—this being the distance from centre to centre of the two eyes, and after photographically reduced viewed through a stereoscope. Looking at pictures in the stereoscope they appear as if seen in relief or as solid objects, because the instrument gives to each eye its proper picture and the brain blends the two pictures into one.

T. B.—THE AMERICAN X-RAY JOURNAL is the parent x-ray journal of the world. It was the first journal in any language devoted to this science and appeared on the first of May, 1897. England, Germany, France and Spain have each followed with such a publication.

S. H.—Fractures, by Dr. Carl Beck is the best book for students and practitioners. In fact this is the only book up-to-date on the subject of fractures. Here can be found not only the most definite language clearing up ambiguity, but in addition the photographic and radiographic illustrations of cases brings to light those valuable points so much sought, but never before found. The book is \$3.50 and published by W. B. Saunders, Philadelphia.

#### Gunstock Deformity.

Cubitus varus or gunstock deformity is carefully studied in its radiographic aspect by Dr. Lewis A. Stinson of New York, in the Annals of Surgery for September. Supra-condyloid fractures are most difficult to diagnose and at no time is a surgeon justified in consigning his patient to a permanent dressing until the condition has been determined by radioscopy. We commend this article in the Annals of Surgery to all practitioners.

## X-RAY AS AN IRRITANT.

By MIHRAN K. KESSARIAN,

Skiagrapher to the Medico-Chirurgical College and Hospital.

In the August issue of the AMERICAN X-RAY JOURNAL, Dr. J. N. Scott, Kansas City, calls the attention of the profession to the subject of "X-Ray Burns" and invited discussion.

It would be a difficult matter for me to enter into the discussion, considering the little experience I have had with the matter of so-called "X-Ray Burns."

The discovery of the x-ray being quite recent, and also having been often manipulated by inexperienced persons, the mistakes and ill effects have been exaggerated by old-fashioned surgeons who do not believe in asepsis and antisepsis and germ theories and who depends solely upon his blind tactile sense, while his vision is available.

Many surgeons claim that they can detect all abnormalities by their old methods, but when they are puzzled in cases of peculiar fractures, foreign bodies, etc., they resort to the use of the x-ray with a humiliated spirit; but to-day very many prominent and skillful surgeons and physicians admit the usefulness of x-rays in medical and surgical cases. Have you any method of operation which is entirely free from danger? or, any specific or "sure cure" remedy for disease? Any method of treatment which is free from mistakes and errors? Why should slight errors and distortions, or burns be therefore a great stumbling block?

I have been interested in x-rays from the beginning of its discovery, and since then I have examined more than 3,000 medical and surgical cases (besides experimenting on animals) and have made more than 800 negatives in the hospital and also in the U. S. Government service during the American-Spanish War (1898-99).

I have read about x-ray accidents (burns) and many physicians and patients have warned me, when I started to make

x-ray pictures. I laughed at them and did not believe that such a thing existed, but nevertheless, I was very careful; every caution being taken to avoid such accidents.

About six months ago I was making some experiments with the x-rays in cases of ophthalmological operations for example, Mule's operation, in which the contents of the eyeballs are removed, and replaced by glass (gold) balls and sometimes artificial eyes.

Case 1st.—A young girl, 21 years of age, on whom the above operation had been performed, and (who had been blind from infancy) was submitted to x-rays in order to see the position of glass balls in orbital cavities.

A plate (6½ x 8½) was fastened to the left temporal region, the distance of tube was 15 inches from the nearest side of the face, exposure 2 minutes (high vacuum). As the patient moved a second plate was exposed. Second plate was spotted, so a third one was made which was perfectly good. The three exposures lasting 30 minutes on the same day.

Two weeks after, according to her story, she noticed that the hair on her right temporal region, which had been nearest to the tube, was falling off.

I saw her in the Hospital the third week after the x-ray photograph was taken, and her hair was brittle and could be pulled out easily. Under the microscope it did not show any pathological change.

Under proper treatment her hair returned to its original and normal condition. This was the *first* case that came under my personal observation.

A Second Case.—That of a young man who was an x-ray demonstrator, and who had charge of the manufacture of Crooke's tubes and coils. The dorsum of his left hand had the appearance of one who had circumscribed subcutaneous hemorrhages.

The *third* case is myself.

About five months ago the fingers, knuckles and dorsum of my left hand ex-

hibited a general erythematous condition. This continued about a month; the itching became intense, the skin became tough, glossy, edematous and yellow.

On my right hand it was less marked, occurring only on the fingers. This I attributed to the fact that I hold the fluoroscope with this hand. I also put my left hand over the fluoroscope and expose it direct to the x-rays. (I used to show it to the patients before I began the application of the x-rays as this tends to prevent the patient's becoming emotional or excited.)

First I thought this condition was due to the chemical action of the developer (Metol) but it was not, evidently, because the discoloration appeared first on the left hand and along the wrist, which is mostly exposed to the rays and less to the developing process; if it had been due to the developer, the right hand would have been affected first and most. And again this is not probable because I have been wearing rubber gloves while developing the negatives. This leads me to believe that the changes taking place in the tissues after exposure to the rays, are due to their chemical (?) action on the tissues. I will discuss briefly the following main points: (1.) Name. (2.) Causes (probable). (3.) Prevention of the x-ray injuries.

The nomenclature of this effect or of the results following the abuse of the x-rays varies, and are very numerous according to the part affected and the degree.

"Burn" is not a proper word to use although it is employed by professional men as well as the laity. I wonder why the clothes of the patient are not burned? Why the patient only burns.

The definition of "Burn" according to the dictionaries are not applicable to the x-ray injuries. (Vide-Century, Webster, etc.) Dr. G. G. Hopkins in the *Philadelphia Medical Journal* of January termed this a "white gangrene." This term seems to be not a proper one, because the definition of "gangrene," according to the medical dictionaries and pathologists, is:

"The total death of a part with putrefaction, etc." It also has been termed "*Dermatitis*" in cases where only the skin is affected. This is a better term than the word "Burn."

2. Causes.—The pendulum of opinions of causes is swinging in many directions, so that many observers of repute and knowledge cannot decide on any apparent cause as yet, as the rays themselves are still a mystery. My opinion is this: The chemical action of the x-rays will cause this disturbance in the tissues. We notice how the x-rays penetrates the body and oxidizes the silver and its different haloid salts in the emulsion of the photographic plate.

So the chemical part of the x-rays while penetrating the human tissue, some part of the rays are absorbed by the cells, or oxidized, or precipitate the organic or inorganic salts in the blood and tissue.

For the various causes of these injuries and their explanation the reader is requested to refer to the work of Dr. D. Walsh, of Edinburg, on "The Roentgen Rays in Medical Work" (1899), second edition, page 210.

I am of the opinion that idiosyncrasies exist because many people are exposed to x-ray demonstration and but very few suffer ill consequences as compared to the administration of drugs and the susceptibilities of disease.

(3) To prevent these accidents I have used the following precautions in my practical x-ray work.

(a) *The Distance of the Focus Tube.*—By increasing the distance of the tube from the object, we get good sharp normal shadows of the part to be taken on the plate. It is the safest way to put the tube as far away as possible. I put the tube 3 feet high from the body in lung and hip cases; but in fluoroscopic examination the safest distances from the tube may be 6 to 8 inch with a duration of 2 to 3 minutes.

(b) *Time of Exposure*—This varies according to the degree of vacuum, the dis-

tance of the tube, thickness of the part to be taken, the sensitiveness of the plate, and whether through plaster of Paris or ordinary dressing. The shorter duration the less the danger.

We do not have as many accidents as we did have in the beginning of the discovery, because the length of exposure can be reduced to a couple of minutes and even to the seconds while formerly in many instances an hour was required. This is a very strong proof that the frequency of the occurrence of "injuries" is increased directly as the length of exposure. The better method is to develop skillfully and try to bring out the details, rather than prolong the exposure. If we can see the shadow of the bones on the fluoroscope, in a fraction of a second, it ought not to take more than a few seconds or fraction of minute to make impression on the photographic plate.

(c) *Frequency of Exposure.* — Short exposures, but frequent ones, are as bad as the long single exposures.

(d) The interposition of an aluminum sheet connected to the earth through the gas pipe or other like means of conduction, is a good method. This will, according to the absorption theory, absorb the chemical rays of the x-rays.

Covering the part with oiled-silk has practical value.

This merely is the outcome of my own experience with the Roentgen Ray.

I leave the matter at this point to the consideration of the profession and, if necessary, for further discussion.

1808 GREEN STREET, PHILADELPHIA, PA.

At a recent meeting of the Roentgen Society, London, Dr. R. Norris Wolfenden and Dr. W. F. Forbes-Ross presented a paper entitled, *The Effects Produced in Culture of Micro-Organisms and of Tubercle Bacilli by Exposure to the Influence of an X-Ray Tube.* Briefly, their investigations prove that the x-rays have no germicidal effect but on the contrary

accelerate the growth of bacilli. No explanation is made for the curative effect of the x-rays, but editorially in the Archives of the Roentgen Rays it is suggested that necrosis of healthy tissue caused by raying may render the parts unsuitable for the growth of bacilli. Especially might this be true with lupus. But this can hardly be ascribed to the death of hair bulbs, to psoriasis, acne, scar tissue, etc. Further and more elaborate research is needed.

#### BRIGHT GREEN PATCHES.

The bright green patches that appear on the inner wall of the Crooke's tube while a discharge is passing, has been carefully considered by Mr. Chas. E. S. Phillips, in the London Electrical Review for September 21. All observers of the x-ray lamp have noticed small bright specks upon the surface of the cathode when an electric charge was entering. Mr. Phillips says that these bright points are due to the emission at that point of fine jets of gas which go out into the attenuated gas in a spiral form. It is from these points on the cathode that the green flecks originate. These jets of gas are actuated by an external magnet and the flecks upon the glass walls are shifted at will. When the bright specks on the cathode change, the flecks also change their position. The bright spots disappear to the vision during high exhaustion but the green flecks may remain. When the discharge through the bulb was stopped the flecks remain 10 seconds. A positively charged body brightened these spots but a negatively charged body extinguished the flecks immediately. This was so also when the electrodes were connected to the earth. These jets of gas assume the property of ionisation while crossing within the bulb and this is essential to the production of local fluorescence in the glass upon which they impinge. The experiments were performed with a pivoted disc of aluminum as

the negative electrode. The external magnet could be used then to shift the electrode which was seen to move the spots also.

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#### LOST NEEDLES.

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Dr. N. S. Scott of Cleveland, Ohio, has a valuable illustrated article in the last quarter issue of the Bulletin of the Cleveland Genl. Hospital. In this article Dr. Scott very carefully shows how easy it is to miss the needle even with a good radiograph though it may be in an object thin as the hand. He gives advice as to the direction of the incision, insisting that it should be at right angles to the shaft of the needle. Caution is however given against the division of tendons and arteries. A radiograph is given of a needle in the thenar eminence which had been unsuccessfully cut for, and the incision having been made at right angles. The plate was before the surgeon and he could see the needle but he could not get it after more than an hours search. The incision was more than two inches long. A subsequent radiograph showed the incision to have been made over the needle. Failure to find it was attributed to the use of retractors displacing the needle to one side.

We are familiar with a case in which a linoleum nail  $\frac{3}{4}$  of an inch long was lodged in the hand of a young women. The nail was located with the fluoroscope and the position determined with the fluorometer. Four indelible marks were made on the skin and instruction furnished the surgeon that the nail was at the intersection of the planes through these lines. The surgeon at his office made a bold and determined incision down to the nail and parallel to the shaft. The patient instantly jerked the hand and the search afterwards failed. The disgusted doctor gave up the hunt and other and more determined surgeons began. Under an anaesthesia the patient was subjected to two hours dissection with complete failure.

The last operator had neither plate nor guiding lines. The blood had washed away the lines traced for the first operator and the plate was still in the developer. The dissection, according to reports, was made over and about the nail badly mutilating the hand. The nail was fixed beneath a sesamoid bone at the inner aspect of the carpo-metacarpal articulation of the thumb and parallel with the shaft. Under an aesthetic or without, with a trusted patient the first surgeon would have succeeded. He had the necessary data and the knowledge.

When a foreign body lays along the shaft or tendon the best known method for its removal is to first locate it with the fluoroscope and the fluorometer. Then make an incision down to the foreign body. As the cut is along the shaft you may fall to one or the other side. Do not subject the patient to any delayed search. With the fluoroscope relocate and at the same time place the scalpel in the wound and you will instantly see the relation the knife has to the foreign body. The slightest cut will now relieve all anxiety.

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#### Application Blank.

##### ROENTGEN SOCIETY OF THE UNITED STATES.

##### APPLICATION FOR MEMBERSHIP.

I hereby make application for membership in the Roentgen Society of the United States.

Si, ned .....

Full name.

P. O. Address.....

\$5.00 must accompany each application. There is no initiation fee. The official organ, "THE AMERICAN X-RAY JOURNAL," free.

DR. J. RUDIS-JICINSKY.

CEDAR RAPIDS, IOWA.

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The Archives of the Roentgen Ray has changed from a quarterly to a bimonthly. The Roentgen Society, London, brought about this change.

**Ankylosed Knee.**

The Journal of Official Surgery for September, contains a radiograph of a knee that had been operated upon one year previous by Dr. E. H. Pratt of Chicago. The joint had been ankylosed 16 years and the patella was bound to the femur with hard bony matter. The joint was united with dense fibrinous bands. In the operation the knee pan was chiseled away from the thigh bone and the adhesions forcibly broken up. The radiograph shows the patella to be free from the femur and the patient is reported to have some use of the joint.

**Spectrum of Radium.**

It is said by Runge that three of Demarcay's lines are not contained in the solar spectrum. This is the result of redetermining the spectrum of radioactive barium chloride.

The continuation of the article by W. A. Price, D. D. S., "The Roentgen Rays with Associated Phenomena and their Application in Dentistry," will be concluded in the November issue of this journal.

Prof. James Wimshurst in the Archives of the Roentgen Ray has given the history of his life's work in developing the influence machine. The article is well illustrated.

**Ionic Conductivity of the Atmosphere.**

Elster and Geitel.—A paper in which they apply Lenard's discovery that ultra-violet light is capable of imparting conductivity to a non-conducting gas, in order to account for the dissipation of the charge of an electroscope by ordinary air. Since the sun's rays contain ultra-violet light before they impinge upon the atmosphere, this light must ionize the upper strata, and the ions produced will be gradually distributed through the whole of the atmosphere by diffusion and convection. Hence the air will contain stray

ions of both signs, possibly differing in frequency with the altitude. It is these ions which gradually discharge a carefully insulated electroscope.—*Ann. der Physik*, No 7; abstracted in *Lond. Elec.*, July 27.

**Absorbtion and Ionisation.**

McLennan.—An account of experiments which prove the following law: When cathode rays of a given strength pass through gas, the number of ions produced per in 1cc depends only on the density of the gas, and is independent of its chemical composition. When cathode rays are absorbed to any extent, the number of the product positive and negative ions bears a constant ratio to the quantity of the rays absorbed.—*Proc. Roy. Soc Abst.*, July 9; abstracted in *Lond. Elec.*, July 27.

**Roentgen Rays.**

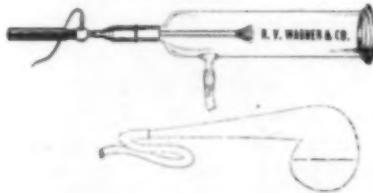
Winkelmann.—An account of an investigation of the effect which a spark gap has upon the production of Roentgen rays at higher pressures of the gas. The maximum pressure, at which rays are produced, depends upon the length of the spark-gap, upon its position, upon the nature of the gas, and upon the dimensions of the tube.—*Ann. der Physik*, v. 2, p. 757; abstracted in *Elek. Zeit.*, Sept. 6.—*Electrical World*, N.Y.

In reference to the newspaper report to the effect that Mr. Edison had invented a new machine for the generation of electricity directly from coal without the intervention of engine, boiler, or dynamo, with a prediction that it would revolutionise the world in electrical matters, Mr. Edison is reported by the *New York Electrical World* as saying: "It is a lie and a fake. There is not a word of truth in it from beginning to end." To be misrepresented is one of the privileges of scientific greatness.—*Electrical Review*, London.

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## Static Cataphoresis.

Much attention is being given to the use of Static Electricity as developed by a Static Machine running at a high rate of speed. For many purposes the current thus developed is of special value and its latest application for the cataphoresis of gaseous substances, such as volatilized mercury, formaldehyde, oil of cinnamon, etc., has proven to be a most effective means of applying such remedies direct to the deceased tissues and is an ideal treatment for consumption, tubercular joints, glands or any local infection. Dr. R. V. Wagner has lately invented and perfected an instrument which makes the use of Static cataphoresis most convenient and will enable any one having a Static machine to avail themselves of this new and effective mode of treatment.



The instrument consists of a glass cylinder made to fit closely to the skin at one end, while the other is fitted with an adjustable discharge brush; the brush should be attached to the positive pole, while patient is in contact with the negative. The discharge of current passing from the brush to the patient through gases or medicated air (which may be admitted to the cylinder through an opening leading to a retort or other receptacle by rubber tubing) drives the substance in with much greater penetration and in a form more suitable than any other known means of cataphoresis.

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## Skin Grafting.

By T. J. BIGGS, M. D., STAMFORD, CONN.

Sam Coen, a German, aged 21, came September 20th, 1895, showing a surface  $2\frac{3}{4} \times 3\frac{1}{2}$  inches denuded of the fascia, in consequence of an injury received six months before. He had been treated at various institutions without result. The ulcer would partially heal, remain stationary for a week or ten days, and then break down and return to its original size. It had been skin-grafted, or rather, this had been attempted, twice, but in both cases all the grafts died.

After two days of preparatory treatment with bovinine, I commenced skin-grafting after my latest method, first thoroughly cleansing the surface with wet Thiersch solution for forty-eight hours, when it is usually in a healthy condition ready for grafts. The grafts being now deposited on the surface, four layers of plain sterilized absorbent gauze are laid over the grafts, carried around the leg and sewed. I allow this dressing to remain on for ten days, constantly feeding the graft through the gauze, by keeping it saturated with the

bovinine and salt water, two to one. This method proves quite as effective as changing the dressing, with rubber tissue to hold the grafts in place; while it has the great advantage of allowing no chance of a single graft being disturbed before it has become firmly fixed.

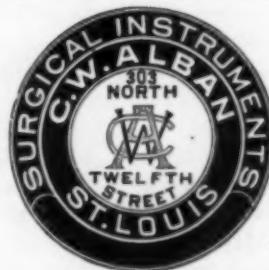
In this case, four minute grafts, of the diameter of a small pea, were distributed over the surface of the wound, covered and fed with bovinine blood as above described, without change for ten days. On examination at the end of that time, all the grafts were found not only immovably fixed, but grown by one-third of their diameter. Thenceforward, the surface was dressed every other day with plain sterilized gauze soaked in bovinine, covered with oiled silk, and bandaged. October 2d, twelve days from the start, the patient was discharged with a complete cure.

#### The Effect of Codeine.

The Medical Record (March 3, 1900) quotes the following from an article by Dr. G. J. Lochboehler in the Journal A. M. A. (Dec. 2, 1899): In epidemic bronchitis codeine is a valuable remedy for the relief of the harassing pain of the cough, and when combined with one of the coal-tar antipyretics the analgesic effects become more pronounced. It is a favorite drug in the cough of phthisis and chronic bronchitis, and its sedative influence is highly satisfactory, clinical data having shown it to be the best succedaneum for opium. Another advantage of codeine over morphine derivatives and one of special value in bronchial affections, is that the patients not only cough less but also expectorate more easily than after taking any of the morphine derivatives. The cough-dispelling power of codeine is such as to make it indispensable in phthisical patients, and a point of great importance in these cases is that it does not impair the appetite or digestion, never produces nausea, and can therefore be used uninterruptedly for months. For the many bronchial and laryngeal neuroses, the exhibition of codeine in combination with antikamnia (antikamnia and codeine tablets) meets with well-merited sanction.

#### Dipsomania.

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stomach, and exercising at the same time a sedative action upon the engaged mucous membrane—three chlorides Henry—is especially serviceable in those forms of dyspepsia and unequalled for the impaired appetite, nausea, morning vomiting and other symptoms accompanying dipsomania.—Medical Essays.